

REMARKS

The present invention relates to transgenic plants modified to accumulate fructooligosaccharides.

In this Amendment, claims 1 and 11 have been amended. Claims 2-4, 7-9, and 13-20 have been canceled. Support for the amendment to claim 1 may be found, e.g., in original claims 3, 4 and 9. Support for the amendment to claim 11 may be found, e.g., in original claim 1, and in the specification, e.g., at page 13, lines 21-22.

In view thereof, and for the reasons discussed below, Applicants respectfully submit that claims 1, 5, 6, and 10-12 meet all statutory requirements and are now in condition for allowance.

On page 2 of the Office Action, claims 2, 13 and 16 were objected to because claim 2 allegedly recites non-elected subject matter and claims 13 and 16 depend from a claim objected to (i.e., claim 2).

Applicants submit that claims 2, 13, and 16 have been canceled, rendering the objection moot, and withdrawal of the objection is respectfully submitted to be proper.

On page 2 of the Office Action, claim 11 was rejected under 35 U.S.C. § 101 as allegedly being directed to non-statutory subject matter.

In response, and while not agreeing that the rejection was appropriate, claim 11 has been amended to recite “wherein the seed or progeny thereof comprises the gene construct,” in accordance with the language suggested by the Examiner on page 3 of the Office Action.

Accordingly, Applicants respectfully submits that present claim 11 meets the statutory requirements under 35 U.S.C. § 101, and withdrawal of the rejection is respectfully submitted to be proper.

On page 3 of the Office Action, claims 1-20 were rejected under 35 U.S.C. §112, first paragraph, for allegedly failing to comply with the enablement requirement.

In response, and while not admitting that the rejection is appropriate, claims 2-4, 7-9, and 13-20 have been canceled, rendering the rejection moot for these claims. Additionally, claim 1 has been amended. Applicants submit that present claims 1, 5, 6, and 10-12 meet the enablement requirements under 35 U.S.C. § 112, first paragraph, including for the following reasons.

Applicants initially submit that MPEP §2164.01(b) provides that “[a]s long as the specification discloses at least one method for making and using the claimed invention that bears a reasonable correlation to the entire scope of the claim, then the enablement requirement of 35 U.S.C. § 112 is satisfied.”

In this regard, Applicants submit that the specification at pages 7-8 provides that in gene (c), the number of nucleotides to be deleted, substituted or added in SEQ ID NO:1 may be 1-60, 1-30, or 1-15, such that the resultant gene encodes β -fructofuranosidase capable of converting sucrose into one or more fructooligosaccharides, and that variants may be obtained by procedures described in WO97/34004.

Additionally, the Office Action recognizes on page 3 that the present specification provides guidance for variants of β -fructofuranosidase derived from *Aspergillus niger*, and guidance for transfecting tobacco and beet.

Accordingly, Applicants submit that present claims 1, 5, 6, and 10-12 comply with the enablement requirements of 35 U.S.C. § 112, first paragraph because the claims are limited to a small genus of transgenic plants and gene constructs, well defined based on both structure and function, and that the skilled artisan would be readily enabled to practice the full scope of the invention; accordingly, withdrawal of the rejection is respectfully submitted to be proper.

On page 5 of the Office Action, claims 1-20 were rejected under 35 U.S.C. § 112, first paragraph, for allegedly failing to comply with the written description requirement.

In response, and while not agreeing that the rejection is appropriate, claims 2-4, 7-9, and 13-20 have been canceled, rendering the rejection moot for these claims. Additionally, claim 1 has been amended. Applicants submit that present claims 1, 5, 6, and 10-12 meet the written description requirements under 35 U.S.C. § 112, first paragraph for the following reasons.

Initially, Applicants note that in the Office Action on page 6, the rationale for the written description rejection is that “[t]he claims are broadly drawn to the transformation of any plant with any beta-fructofuranosidase from any source, or any plant with any variant of SEQ ID NO:1 wherein sucrose would be converted into an fructooligosaccharide,” which is similar to that set forth for the enablement rejection as discussed above. Therefore, Applicants submit that present claims 1, 5, 6, and 10-12 meet the written description requirements under 35 U.S.C. § 112, for

the reasons discussed above; accordingly, withdrawal of the rejection is respectfully submitted to be proper.

On page 7 of the Office Action, claims 4, 15, and 18 were rejected under 35 U.S.C. § 112, second paragraph as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Specifically, the Office Action asserted that the term “homology” as defined in paragraph 47 of the specification is unclear because there are several algorithms used by BLAST and because there several meanings for homology.

Initially, Applicants submit that claims 4, 15 and 18 have been canceled, rendering the rejection moot for these claims. Furthermore, Applicants traverse the rejection as applied to present claim 1 for the following reasons.

Applicants submit herewith the technical document entitled “BLAST Algorithm.” As shown in the attached technical document, BLAST is one of the most widely used bioinformatics programs (see page 2). BLAST is actually a family of programs (see page 8), but Applicants submit that one of ordinary skill in the art could necessarily select the nucleotide-nucleotide BLAST (blastn) from among the programs to calculate the homology between nucleotide sequences as described in the claim.

Accordingly, Applicants respectfully submits that present claim 1 meets the written description requirements under 35 U.S.C. § 112, second paragraph, and withdrawal of the rejection is respectfully submitted to be proper.

On page 6 of the Office Action, claims 1-20 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Smeekens et al. (WO199601904).

Initially, Applicants submit that claims 2-4, 7-9, and 13-20 have been canceled, rendering the rejection moot for these claims. Applicants submit that present claims 1, 5, 6, and 10-12 are patentable over Smeekens et al. for the following reasons.

Initially, Applicants note that the Office Action admits on page 7 that Smeekens teach the transformation of both a sugar beet and a potato with a genetic construct comprising a sucrose-fructan 6-fructosyltransferase (6-SFT) gene from barley.

Applicants submit herewith the technical document entitled “Enzyme Nomenclature (Recommendations of the Nomenclature Committee of the International Union of Biochemistry and Molecular Biology on the Nomenclature and Classification of Enzymes by the Reactions they Catalyse).”

Applicants submit that β -fructofuranosidase used in the present invention is a hydrolase which is classified into EC3.2.1.26 in the IUBMB (Nomenclature Committee of the International Union of Biochemistry and Molecular Biology) classification (see page 6, lines 5-8 of the specification), but 6-SFT is a transferase classified into EC2.4.1.10 (see the last page of “Enzyme Nomenclature”).

Therefore, Applicants submit that the 6-SFT disclosed in Smeekens et al. is different from β -fructofuranosidase used in the present invention.

Applicants further submit that claims 5, 6, and 10-12 are patentable by virtue of their dependency from claim 1. Accordingly, Applicants respectfully submit that the present claims are not anticipated by Smeekens et al., and withdrawal of the rejection is respectfully submitted to be proper.

On page 8 of the Office Action, claims 1-20 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Smeekens et al. in view of Yanai et al. (U.S. Paten 6,337,201).

Initially, Applicants submit that claims 2-4, 7-9, and 13-20 have been canceled, rendering the rejection moot for these claims. Applicants submit that present claims 1, 5, 6, and 10-12 are patentable over the cited references for the following reasons.

Applicants submit that the Office Action has not provided a rational reason for one skilled in the art to modify the transformation disclosed Smeekens et al. with the β -fructofuranosidase gene of Yanai et al. Specifically, it is noted that the Office Action alleges that the comparison of sequences between plant, bacterial and fungal sources at page 28, lines 20-38 of Smeekens et al. would provide a reason for one of ordinary skill in the art to combine the *Aspergillus niger* β -fructofuranosidase gene of Yanai et al. with the transformation methods disclosed in Smeekens et al. However, Smeekens et al. discloses sequence comparison analysis of the 6-SFT amino acid sequence with known β -fructosidases and fructosyltransferases of different vegetable, fungal and bacterial invertases, and with bacterial levanases and levansucrases. *See*, Figures 9 and 10. As discussed above, Applicants submit that fructosyltransferases are different from fructofuranosidase (which is a feature of the present

application), and that Smeekens et al. does not include fructofuranosidase in the sequence comparison studies on page 28.

Therefore, Applicants submit that the Office Action has failed to provide a rational underpinning for one of ordinary skill in the art to combine the disclosures of Smeekens et al. and Yanai et al, for the reasons explained above. Accordingly, claim 1 is not obviousness over the cited references. Further, Applicants submit that claims 5, 6, and 10-12 are patentable over the cited references by virtue of their dependency from claim 1. Accordingly, Applicants respectfully submits the present claims are not rendered obvious by Smeekens et al. in view of Yanai et al., and withdrawal of the rejection is respectfully submitted to be proper.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby earnestly solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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